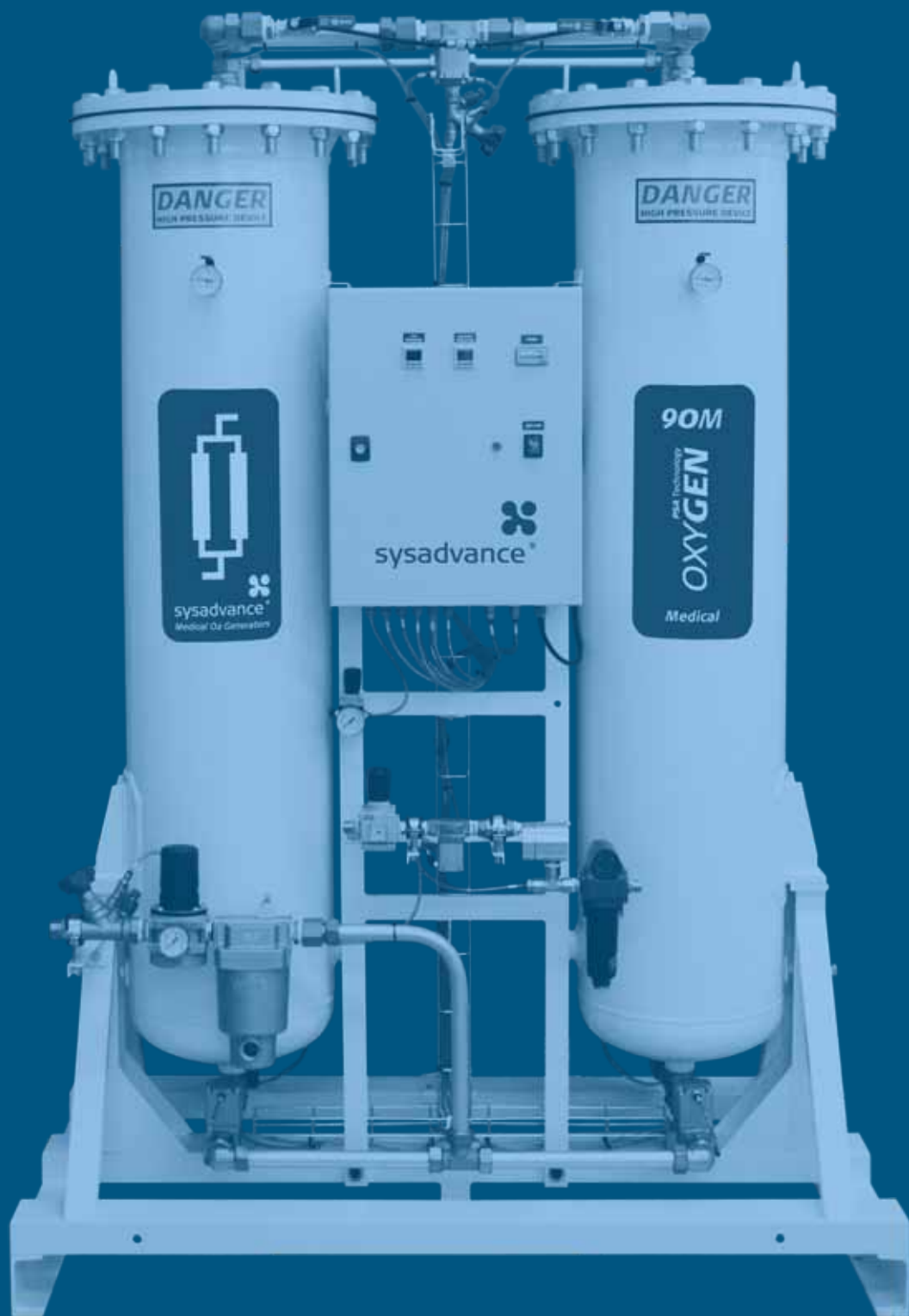


SYSADVANCE

SHAPING THE FUTURE OF TECHNOLOGY





N₂ | O₂ | O₂ VSA | MEDICAL O₂ GENERATORS | BIOGAS | H_e | H₂ | SF₆ PURIFICATION

INDEX

04 • The company

05 • PSA Technology

08 • OXYGEN M series

14 • Medical AIR
– *Air**SYS M***

18 • Medical VACUUM
– *Vacuum**SYS M***

21 • Global Presence



THE COMPANY

SYSADVANCE is a technology company founded in 2002.

Today we develop and manufacture on-site gas generators and gas purifiers, as well as integrated solutions for compressed air and technical gases.

SYSADVANCE product portfolio comprises Nitrogen Generators, Oxygen Generators, including Medical Oxygen 93 and VSA Oxygen Generators, solutions for purification of biogas, Helium, Hydrogen and SF6, as well as a wide range of "turn-key" customized engineering solutions.

SYSADVANCE successful projects are the reflection of the quality and dedication of our highly specialized human resources.

Today, SYSADVANCE offers solutions for several industries and sectors such as: chemical and pharmaceutical, electronic components, metal works, aquaculture, water treatment, engineering, automotive, food, wine, aviation, marine, energy, medical, oil and gas, among others.

SYSADVANCE is present today in more than 40 countries, rendering a solid growth as result of a strategy oriented for creating value to our clients, based on superior technology, quality and reliability of our products, as well as continuous innovation.



PSA TECHNOLOGY

PRESSURE SWING ADSORPTION

Pressure Swing Adsorption can be used to produce Oxygen from compressed air, which is fed to the unit that uses adsorption phenomena to remove the contaminants: H₂O and CO₂ are removed as other minor contaminants.

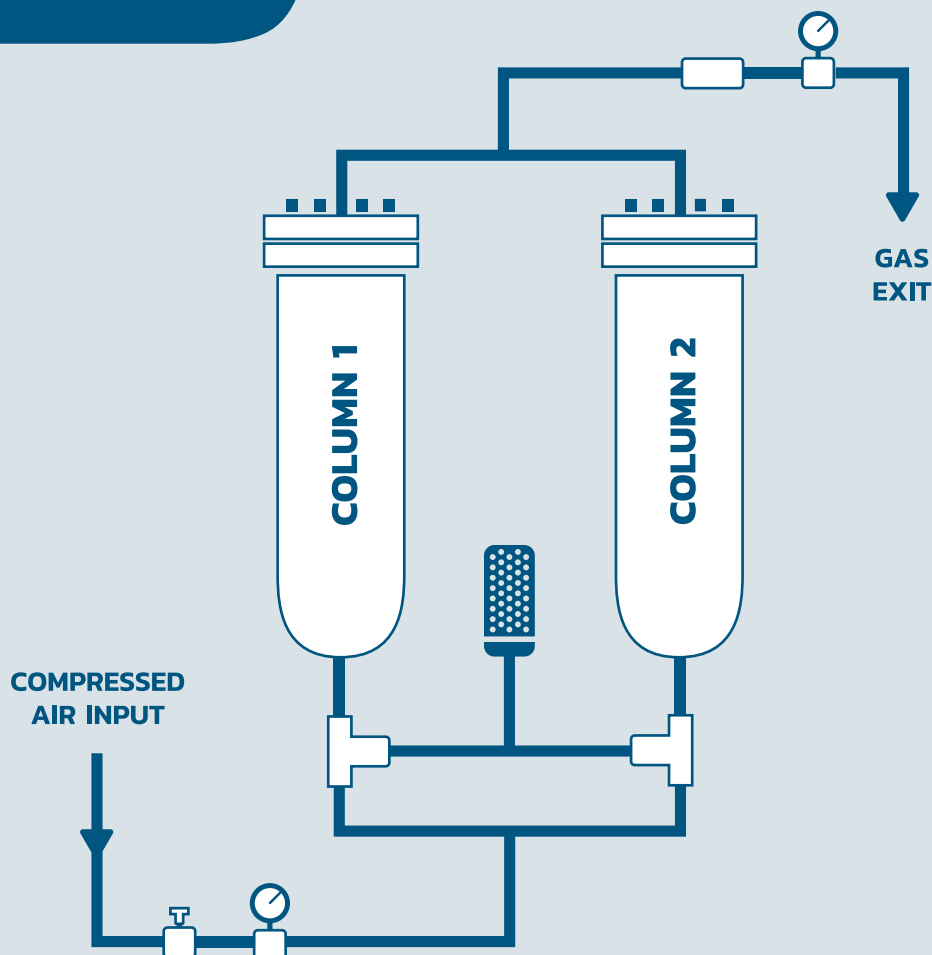
The PSA unit contains two columns packed with a selective adsorbent that has affinity towards the component to be removed: zeolite are used to produce O₂.

Each column undergoes a cyclic sequence of high and low pressure steps that guarantees the production of a continuous flow of high purity gas.

In the high pressure step, the adsorbent retains the contaminants present in the compressed air and the desired gas (O₂) is obtained from the top of the columns.

The regeneration is accomplished in the low pressure step, with the release of contaminants retained by the adsorbent.

PSA TECHNOLOGY



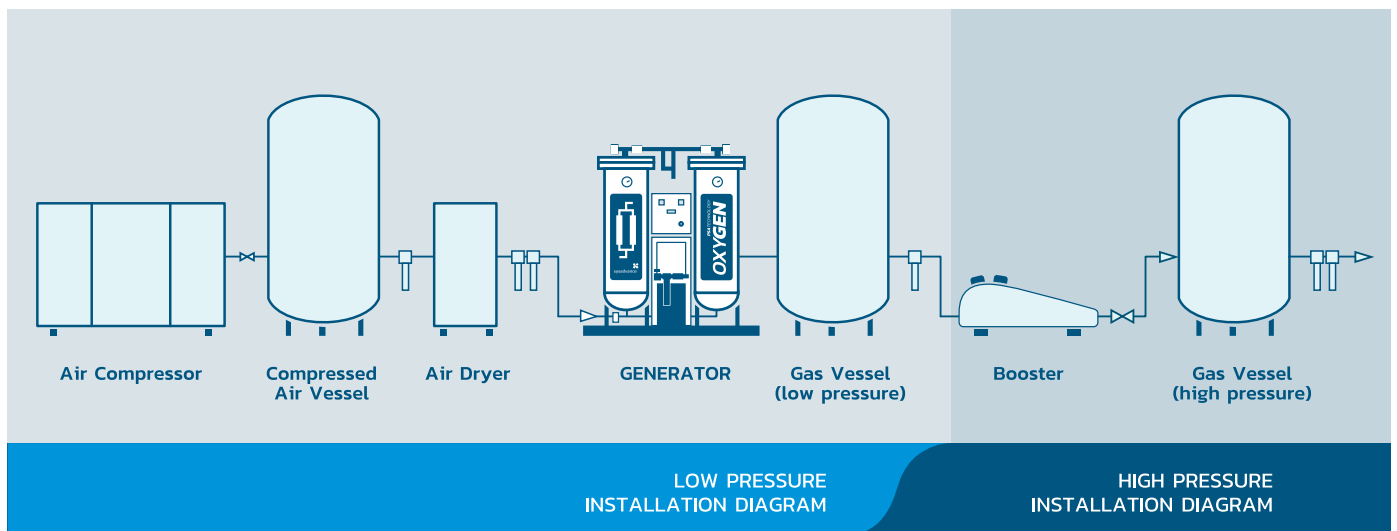
PSA TECHNOLOGY

PSA ADVANTAGES

- **Economy**
 - 90% reduction in the cost of Oxygen
- **Convenience**
 - elimination of logistical and administrative operations
- **Continuous availability**
 - elimination of orders and deliveries
- **Modularity / Scalability**
 - your installation grows with you
- **Robustness, reliability and durability**
- **Reduced maintenance**
- **Security**
- **Ready-to-use engineering solutions**



PSA SYSTEM



OXYGEN M SERIES

GENERATORS



O₂
MED

GENERATORS

OXYGEN M SERIES

GENERATORS

DESCRIPTION

SYSADVANCE 'M' Series Oxygen generators and systems are specially designed to supply Oxygen 93 compliant with European Pharmacopoeia – Oxygen 93 Monograph and are certified according to class IIb European Medical Device aimed at health care facilities, ranging from small clinics to large size hospitals, with operating ICU and OR's. The Oxygen unit is fully automated and controlled by a PLC.



ADVANTAGES

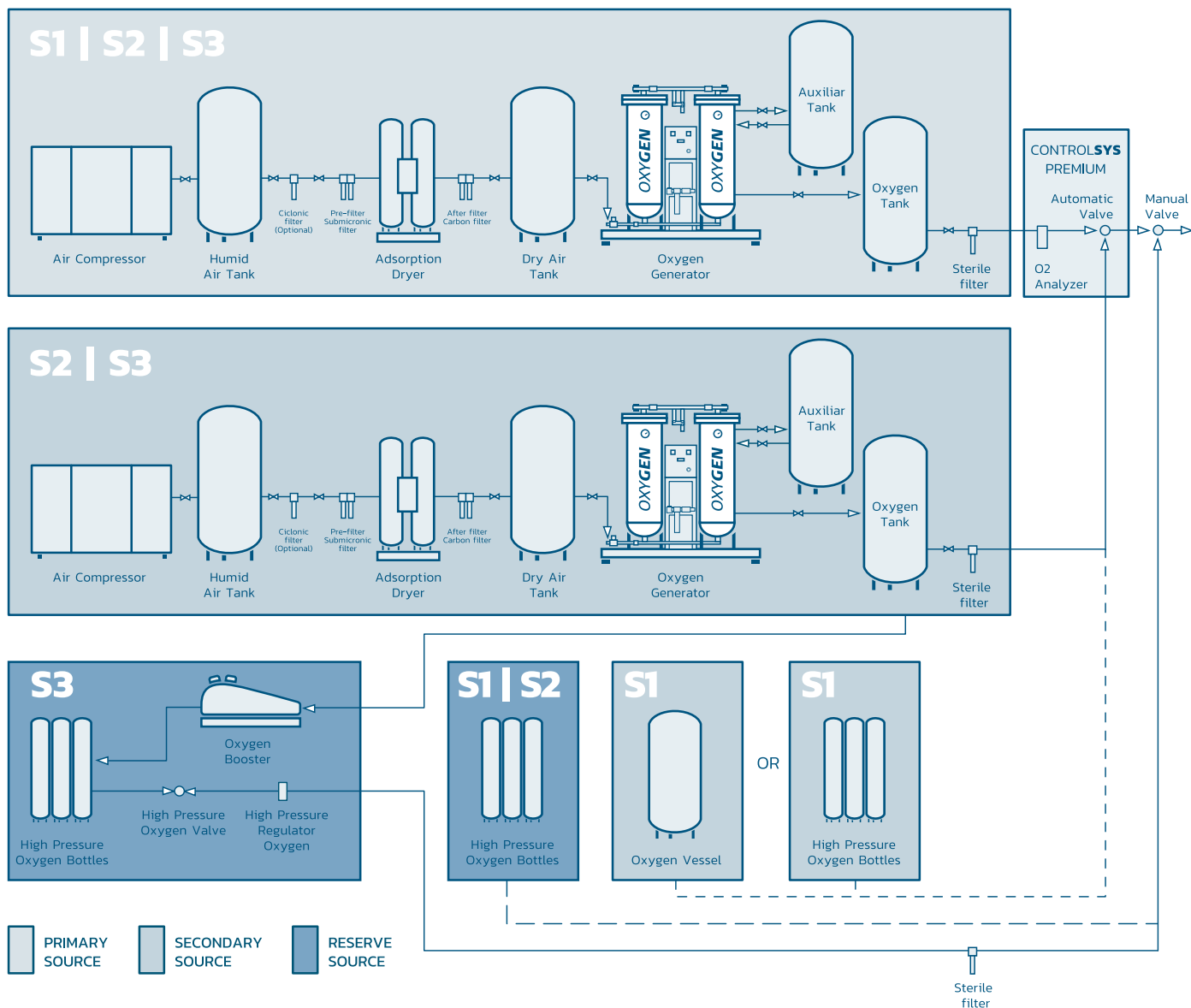
- **ECONOMY**
 - reduction of 90% of Oxygen costs;
- **COMFORT**
 - elimination of the logistic and administrative operations;
- **CONTINUOUS AVAILABILITY**
 - elimination of orders and deliveries;
- **SECURITY**
 - low pressure non-cryogenic solution;
- **CERTIFICATION**
 - Certified quality management system according to ISO 13485
 - Certified generators and systems according to medical devices directive 93/42/EEC;
- Container and skid-mounted solutions available.



OXYGEN M SERIES

GENERATORS

INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:



09

POSSIBLE SYSTEM CONFIGURATION OPTIONS:

- **S1** · 1 PSA system + 2 external sources (cryogenic and/or cylinders)
- **S2** · 2 PSA systems + 1 external source (cylinders)
- **S3** · 2 PSA systems + 1 high-pressure emergency backup system

THE OXYGEN SUPPLY SYSTEM SHOULD HAVE 3 SOURCES OF SUPPLY:

- PRIMARY, SECONDARY AND RESERVE.

ISO 7396-1 – Pipeline systems for compressed medical gases and vacuum*

* ISO 7396-1 replaces ISO 10083



OXYGEN M SERIES

GENERATORS

EUROPEAN PHARMACOPOEIA REQUIREMENTS FOR MEDICAL OXYGEN 93

O ₂	93 ± 3%
CO ₂	< 300 ppm V/V
CO	< 5 ppm V/V
NO e NO ₂	< 2 ppm V/V
SO ₂	< 1 ppm V/V
OIL	<0.1 mg/ m ³
WATER	< 67 ppm V/V



CE 0120

ADVANTAGES OF FULL SYSTEM CERTIFICATION

** SYSADVANCE designs and installs Oxygen PSA Generators and Systems to produce according to European Pharmacopoeia Oxygen 93 Monograph.*

** SYSADVANCE EC Medical Certification comprises generator only or full system.*

** Full system certification includes:*

- Dimensioning and specification;
- Manufacturing;
- Full test and factory validation including mass spectrometer analysis;
- As-built layout and P&ID;
- Installation, start-up and training;
- On-site validation;
- Certified maintenance program;
- Periodic assessment of gas quality;
- Oxygen monitoring compliance.

SYSADVANCE system certification provides health care facilities with oxygen quality and security of supply under Oxygen 93 Monograph requirements.

OXYGEN M SERIES

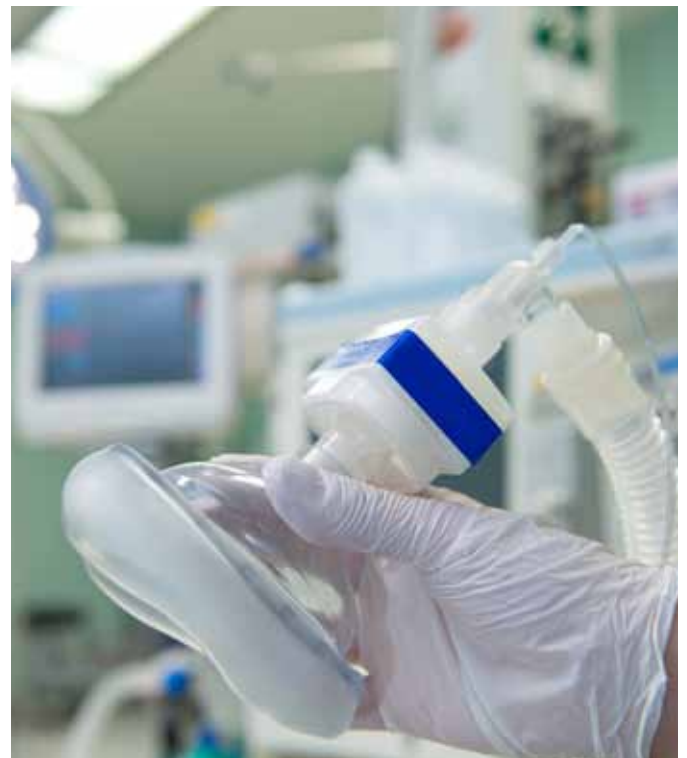
GENERATORS

QUALITY & CERTIFICATION

SYSADVANCE Oxygen generators and systems are CE marked under Medical Devices Directive 93/42/EEC (class IIb) and Oxygen produced complies with European Pharmacopoeia – Oxygen 93 Monograph.



CE 0120



OXYGEN M SERIES

GENERATORS

PERFORMANCE

MODEL	93%			Air consumption		95%			Air consumption	
	Nm ³ /h	NL / min	SCFH	Nm ³ /h	Nm ³ /h	NL / min	SCFH	Nm ³ /h	Nm ³ /h	Nm ³ /h
OXYGEN 3M	0,32	5,3	11,2	3,5	0,3	4,7	9,9	3,5		
OXYGEN 5M	0,78	13	27,4	8,6	0,7	11,4	24,1	8,5		
OXYGEN 10M	1,1	18	38	12	0,9	16	33	12		
OXYGEN 35M	3,1	52	109	35	2,5	42	88	32		
OXYGEN 50M	4,6	77	162	52	3,8	63	134	47		
OXYGEN 70M	6,5	108	230	74	5,3	88	187	66		
OXYGEN 80M	8,0	133	282	90	6,5	108	230	81		
OXYGEN 90M	9,5	158	335	108	7,8	130	275	97		
OXYGEN 110M	12,4	207	438	141	10,1	168	357	126		
OXYGEN 150M	18,2	303	643	206	14,8	247	523	185		
OXYGEN 200M	26,2	437	925	296	21,3	355	752	266		
OXYGEN 300M	36,5	608	1289	413	29,7	495	1049	371		
OXYGEN 400M	43,5	725	1536	492	35,3	588	1246	442		
OXYGEN 500M	55,7	928	1967	629	45,2	753	1596	566		
OXYGEN 800M	82,7	1378	2918	934	67,2	1119	2372	839		

Performance at preference conditions 20°C and 1 bar atmospheric pressure.

Purity values are measured in oxygen content (Variation $\pm 1.5\%$).

Purity values may slightly vary during the lifetime of the generator and are dependent, among other factors, on the inlet compressed air (CA) quality.

Dew-point: an adsorption air dryer (-40°C dew-point) is required.

The produced oxygen flow will have a dew-point of -60°C ($<50\text{ppm}$ of water vapour).

Required inlet compressed air quality is 1:2:1 as in ISO 8573-1.

The OXYGEN M series comply with the Monography 93 of the European Pharmacopeia in its actual version for Oxygen, 7.1 and above, for Oxygen Concentrators for Hospital use. Full System Installation can be certified by SYSADVANCE if installed according to approved specification



AirSYS M

AIR

MEDICAL AIR

AirSYS M

MEDICAL AIR

DESCRIPTION

MEDICAL AIR STANDARDS

SYSADVANCE medical air systems are medical devices certified according to MDD 93/42/EEC – Class IIa. They also comply with the most demanding standards and regulations such as the European Pharmacopoeia – Medical Air Monograph and HTM 02-01. **SYSADVANCE** QMS is certified according to ISO 13485.

MEDICAL AIR APPLICATIONS

Medical air in gas state is mainly used in respiratory therapy as a power source for patient ventilators, and for blending with oxygen.

It is also used as the driving gas for nebulized drugs and chemotherapy agents.

COMPRESSOR TECHNOLOGIES

SCROLL – Oil free

Two spiral elements: one moves in eccentric circles and the other one is stationary. Air gets trapped between the two spirals at the suction side and gets transported and compressed to the center of the spiral. **Quiet operation and oil-free air.**



ROTARY SCREW

Two counter-rotating screws housed in a chamber (air-end). The area containing the air gets increasingly smaller as the air moves along, and the pressure increases.

High-volume, steady stream of compressed air, easy maintenance.



RECIPROCATING – Oil free

Positive displacement compressors in which the compressing and displacing element is a piston having a reciprocating motion within a cylinder. **Small footprint and oil free air.**



TREATMENT AND CONTROL TECHNOLOGY

The air passes through the air compressor and the adsorption dryer, being stored, afterwards, in a high pressure vessel with a dew point below -40°C .

The cycling mode of the adsorption dryer is controlled by a built-in dew point meter allowing significant energy savings. The AirSYS M system is fully automated and controlled by PLC, not requiring any human intervention.

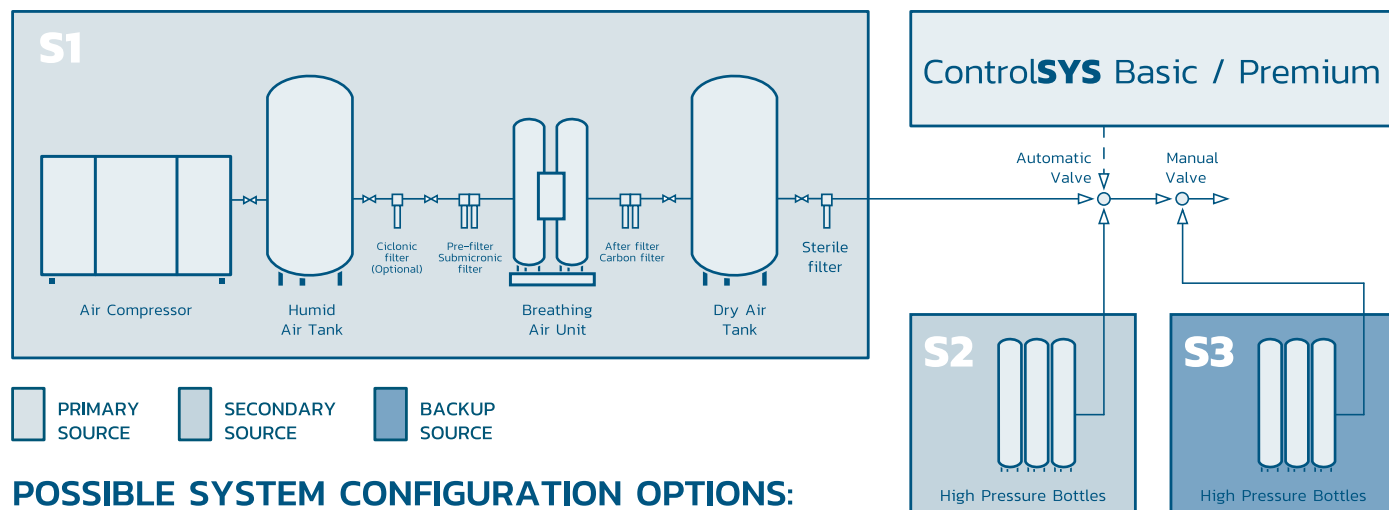
ADVANTAGES

- **ECONOMY**
 - Reduction of medical air costs;
- **CONTINUOUS AVAILABILITY**
 - Elimination of orders and deliveries;
- **CONVENIENCE**
 - elimination of the logistic and administrative operations;
- **CERTIFICATION**
 - Certified quality management system according to ISO 13485
 - Certified medical air systems according to Medical Devices Directive 93/42/EEC;
- **CONTAINER AND SKID**
 - Mounted solutions available;
- **Adsorption dryer with dew point controller.**

AirSYS M

MEDICAL AIR

INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:



POSSIBLE SYSTEM CONFIGURATION OPTIONS:

- **S1** · 1 AirSYS M System + 2 High pressure sources
- **S2** · 2 AirSYS M Systems + 1 High pressure source
- **S3** · 3 AirSYS M Systems

THE MEDICAL AIR SUPPLY SYSTEM SHOULD HAVE 3 SOURCES OF SUPPLY: PRIMARY, SECONDARY AND RESERVE.

EN ISO 7396-1

- Medical gas pipeline systems

15

ADVANTAGES OF FULL SYSTEM CERTIFICATION

*** SYSADVANCE designs and installs Medical Air Systems according to Medical Air Monograph.**

*** Full system certification includes:**

- Dimensioning and specification;
- Manufacturing;
- Full test and factory validation including mass spectrometer analysis;
- As-built layout and P&ID;
- Installation, start-up and training;
- On-site validation;
- Certified maintenance program;
- Periodic assessment of gas quality.

SYSADVANCE system certification provides health care facilities with Medical Air quality and security of supply under Medical Air Monograph requirements.

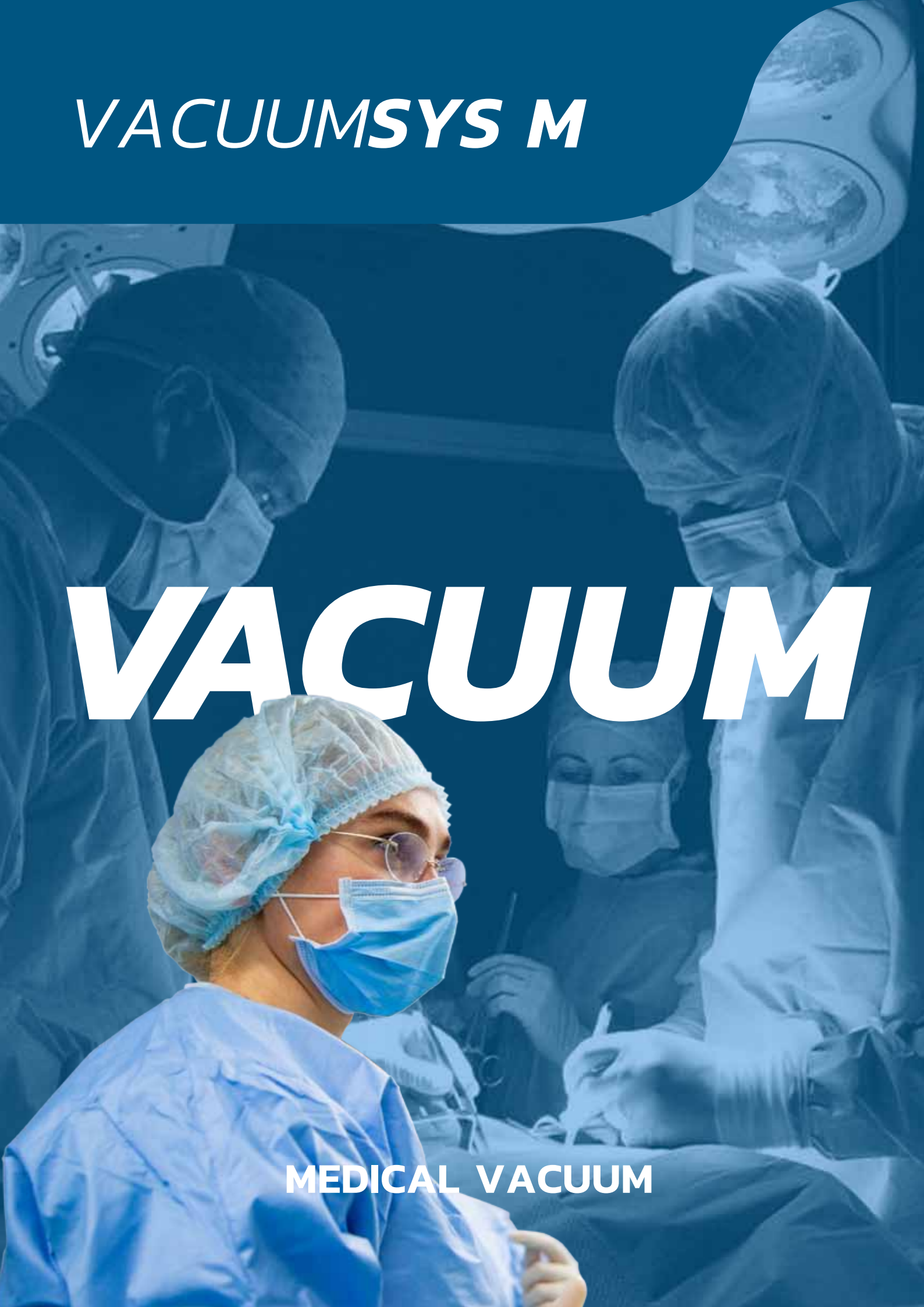


AirSYS M

MEDICAL AIR

PERFORMANCE / SPECIFICATIONS

MODEL	Air Flow	Vessel	Scroll	Screw	Piston
Operating Pressure: 8 barg.	m³/h	l			
AirSYS M 1	11	250	•		•
AirSYS M 2	16	250	•	•	•
AirSYS M 3	26	250	•	•	
AirSYS M 4	31	250	•	•	
AirSYS M 5	41	500	•	•	
AirSYS M 6	58	500	•	•	
AirSYS M 7	72	500	•	•	
AirSYS M 8	96	500	•	•	
AirSYS M 9	120	500	•	•	
AirSYS M 10	140	750	•	•	
AirSYS M 11	160	750	•	•	
AirSYS M 12	219	1000	•	•	
AirSYS M 13	271	1000	•	•	
AirSYS M 14	286	1500	•	•	
AirSYS M 15	380	1500	•	•	
AirSYS M 16	450	2000	•	•	
AirSYS M 17	560	3000	•	•	
AirSYS M 18	720	3000	•	•	



VACUUMSYS M

VACUUM

MEDICAL VACUUM

VACUUMSYS M

DESCRIPTION

MEDICAL VACUUM STANDARDS

SYSADVANCE medical vacuum systems are medical devices certified according to MDD 93/42/EEC – Class IIa. They also comply with the most demanding standards and regulations such as HTM 02-01. **SYSADVANCE** QMS is certified according to ISO 13485.

MEDICAL VACUUM APPLICATIONS

VacuumSys M is intended to be used in hospitals attending several medical applications, in OR and ICU, and procedures (negative-pressure wound therapy – NPWT – removal of excess blood during surgery, drainage, etc.).

ADVANTAGES

- EASY AND QUICK INSTALLATION;
- COMPACT SYSTEM;
- QUALITY COMPONENTS;
- ENERGY EFFICIENT;
- INTELLIGENT SWITCH AND ROTATION OF VACUUM PUMPS;
- LOCAL AND REMOTE ALARMS
- CERTIFICATION
 - Certified quality management system according to ISO 13485
 - Certified medical vacuum according to Medical Devices Directive 93/42/EEC.

VACUUM PUMP TECHNOLOGY

ROTARY VANE – DRY or LUBRICATED

With rotary positive displacement. Pumping system consists of a housing, an eccentrically installed rotor and vanes that move radially, displacing the air from the inlet to the outlet. **Economic, with high ultimate vacuum.**



DRY CLAW

Two claws turning in opposite directions in a housing, separated from one another by a minimum gap. The intake air is compressed by the special geometrical form of the claws and expelled at the delivery connection on the end. **Low maintenance, high reliability.**



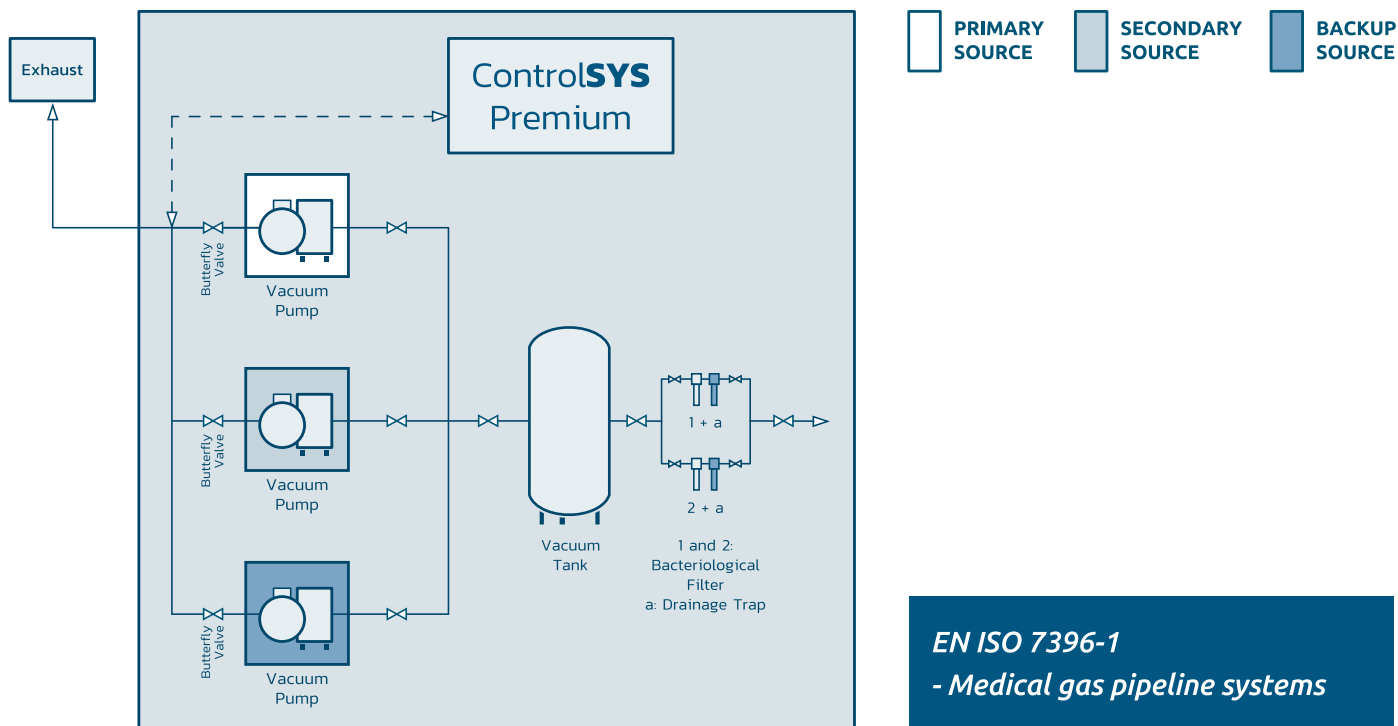
CONTROL AND FILTER TECHNOLOGY

- Galvanized vacuum vessel with a wide range of volumes;
- Double filtration – medical vacuum sterile filters with drain jar;
- Fully automated and controlled by PLC;
- Intelligent control system
 - automatic management of vacuum pumps order of operations for an equitable distribution of working hours;
- Local and remote alarms via GPRS (optional).



VACUUMSYS M

INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:



19

ADVANTAGES OF FULL SYSTEM CERTIFICATION

*** SYSADVANCE designs and installs Vacuum Air Systems to produce according to EN ISO 7396-1, HTM 02-01.**

*** Full system certification includes:**

- Dimensioning and specification;
- Manufacturing;
- Full test and factory validation;
- As-built layout and P&ID;
- Installation, start-up and training;
- On-site validation;
- Certified maintenance program.



CE 0120

VACUUMSYS M

PERFORMANCE / SPECIFICATIONS

MODEL	Pump Capacity	Ultimate Pressure	Nominal Power p/ Pump	Vessel Capacity
	(m ³ /h) @ 400 mbar	mbar	kW	l
VacuumSYS 25 M	25	0,1	0,75	250
VacuumSYS 40 M	40	0,1	1,1	250
VacuumSYS 63 M	63	0,1	1,5	500
VacuumSYS 100 M	100	0,1	2,2	500
VacuumSYS 160 M	160	0,1	4,0	1000
VacuumSYS 200 M	200	0,1	4,0	1000
VacuumSYS 250 M	250	0,1	5,5	1000
VacuumSYS 300 M	300	0,1	5,5	2000
VacuumSYS 400 M	400	0,1	11	2000
VacuumSYS 500 M	500	0,1	11	2000
VacuumSYS 9 M Dry	9,0	150	0,37	250
VacuumSYS 14 M Dry	14	150	0,55	250
VacuumSYS 22 M Dry	22	120	0,9	250
VacuumSYS 38 M Dry	38	120	1,25	250
VacuumSYS 55 M Dry	55	60	1,1	500
VacuumSYS 72 M Dry	72	60	1,5	500
VacuumSYS 95 M Dry	95	60	2,2	500
VacuumSYS 125 M Dry	125	60	3,0	500
VacuumSYS 140 M Dry	140	60	3,0	500
VacuumSYS 180 M Dry	180	100	4,0	1000
VacuumSYS 225 M Dry	225	100	4,5	1000
VacuumSYS 270 M Dry	270	150	5,5	1000

***Providing
medical Oxygen 93,
Air and Vacuum
to a wide-range of
medical and
healthcare
facilities***



GLOBAL PRESENCE



PUBLICATIONS



***see our
Industrial
& Energy
products***



www.sysadvance.com